C-AXIS INTRA-LAYER COUPLINGS IN THE CuO_2 PLANES OF HIGH-T_C CUPRATES

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Abstract. We discuss the static deformations of the doped CuO_2 lattices in $YBa_2Cu_3O_x$. Intrinsic lattice effects driven by the strong correlations of the electron system are separated from extrinsic chemical and bandstructure effects. c-axis displacements of the planar copper atoms seem to be a generic property of the metallic CuO_2 lattices.

1. Introduction

Unconventional metals exhibit a plethora of unusual lattice effects not observed in "simple" band metals. In the physics of strongly correlated electron systems these puzzling "lattice instabilities" are usually ignored or relegated to the high energy scale of the crystal chemistry. This lecture focusses on the *static* distortions of the nearly square planar CuO_2 lattices in the under- and overdoped regimes of $YBa_2Cu_3O_x$, the superconducting cuprate with the best known lattice structure. We shall discuss the doping dependence of the basal lattice parameters, the CuO_2 dimples, and the orthorhombicity. The structural data suggest that doping into a Mott insulator leads to weak but significant deformations of the metallic CuO_2 lattice. Our focus is on the structural aspects of the normal state; it is not intended to suggest the inclusion of electron-lattice interactions into a specific model of high-T_c superconductivity.

2. Planar and perpendicular orbitals

The pioneering work of Müller and Bednorz (1) has been guided by the idea of high-T_c superconductivity (HTSC) in transition-metal chalcogenides with strong Jahn-Teller (JT) effects. In fact, the strong JT effect is confirmed to play a crucial role for the electronic structure of the superconducting cuprates selecting from the e_g doublet the antibonding $3d_{x^2-y^2}$ as the

only relevant d orbital in the plane of the Cu–O polyhedron. It generates the ernormous stability of the square-planar CuO_2 structure. An electronically active role of the perpendicular $3d_{z^2}$ orbital is however not confirmed.

But superconductivity is not a purely 2-dimensional effect. T_c depends strongly on interactions of the planes with the doping reservoir, and a mechanism linking the plane with its perpendicular surroundings is expected to be involved in the formation of the electronic ground state. Recent calculations of the one-electron bandstructure of $YBa_2Cu_3O_7$ (2) show that the generic low-energy layer-related features have to be described by the planar orbitals Cu3$d_{x^2-y^2}$, O2$p_{x,y}$ directing in the plane, *and* the isotropic Cu4s orbital. The chemical trend of T_{cmax} is found to be controlled by the energy of a "perpendicular orbital" , a hybrid between Cu4s, Cu3d_{z^2}, the apical O2p_z, and farther d_{z^2} or p_z orbitals. Interestingly materials with the perpendicular orbital more localized onto the CuO_2 layers, *i.e.* with pure Cu4s character, exhibit the highest T_{cmax}. It seems that the strong hybridization between Cu3$d_{x^2-y^2}$ and Cu4s allows for atomic displacements in the rigid covalent CuO_2 lattice of the parent Mott insulator such that doped holes are optimally accomodated in the background of the quantum liquid of spin singlets.

Notably the dependence of T_{cmax} from the structure and the chemistry perpendicular to the planes enters a single-band many electron Hamiltonian simply by the ratio of the nnn and nn hopping integrals, t'/t. It is worthwile to stress that the (rare) acknowledgement of the chemistry outside the planes as an integral part of the HTSC problem does not justify dynamically independent treatments of the Cu3d and O2p electrons in any kind of multi-band many electron Hamiltonians.

3. Dimpled CuO_2 planes

The CuO_2 planes of the superconducting cuprates are not perfectly flat but dimpled. Many diffraction work, *e.g.* Ref. (3, 4, 6, 8), and some EXAFS studies (9, 10) yield evidence for dimples in the relevant CuO_2 planes of the multi-layer cuprates, *i.e.* the planes adjacent to the doping reservoirs, *cf.* table I. "Buckled" planes are also observed in single-layer materials, most clearly in the doped La_2CuO_4 systems, but so far not in the single-layer Hg- and Tl-cuprates (4). As we shall see, the dimplings in the latter materials are expected to be *small*, and since their CuO_2 planes are crystallographic inflection planes the usual crystallographic refinements tend to average them to zero.

We distinguish "chemical" dimples driven by external electrostatic polarization along c, mixed valence of the dopants, lattice mismatches and other bandstructure effects, from "correlation-driven" dimples generic of

TABLE I. CuO_2 dimplings in typical HTSC, see text.

Compound	$P_\perp$	N_L	Dimpling (Å)	T_c	Ref.
$YBa_2Cu_3O_x$	$3^+ - 2^+$	2	0.28	92	(3, 9)
$YBa_2Cu_4O_8$	$3^+ - 2^+$	2	0.24	80	(8)
$Pb_2Sr_2YCu_3O_8$	$3^+ - 2^+$	2	0.23	70	(6)
$HgBa_2(Ca,Y)Cu_2O_x$	$2^+/3^+ - 2^+$	2	0.10	85-110	(4)
$HgBa_2CaCu_2O_x$	$2^+ - 2^+$	2	0.02	120	(4)
$HgBa_2Ca_2Cu_3O_x$	$2^+ - 2^+$	3	0.05	132	(4)
$HgBa_2Ca_3Cu_4O_x$	$2^+ - 2^+$	4	0.05	127	(4)

the strongly correlated electron system. We show that the former define a *large* lengthscale of ~ 0.3 Å, and the latter a *small* lengthscale of ~ 0.03 Å, corresponding to buckling angles of $\sim 10°$, and $\sim 1°$, respectively. The contribution of the chemical dimples in many of the doped metallic phases can be traced back to the lattice of their antiferromagnetic parent phase, and thus be differentiated from the correlation-driven dimples. However in concentrated alloys, doped by varying ratios of one or two combinations of heterovalent cations, the correlation-driven dimples may be masked by the varying external electrostatic polarizations (12). Table I compares the CuO_2 dimplings in some typical multi-layer cuprates with each other: as a function of the static charge contrast polarizing the CuO_2 layer perpendicularly, $P_\perp$, the number of CuO_2 layers, N_L, and T_c. The *large* lengthscale of ~ 0.3 Å shows clearly up in all compounds with $P_\perp = 2^+ - 3^+$, but is absent in compounds with $P_\perp = 2^+ - 2^+$. Materials alloyed with heterovalent cations, *e.g.* Ca^{2+}/ Y^{3+}, exhibit intermediate values. Notably CuO_2 layers sandwiched between isovalent layers seem to exhibit higher T_{cmax} than those between heterovalent layers, *cf.* Ref. (7).

4. Perpendicular and planar CuO_2 deformations in $YBa_2Cu_3O_x$

Figure 1b sketches a metallic CuO_2 layer of $YBa_2Cu_3O_x$ as a stack of copper and oxygen layers. The horizontal dashed lines in Figure 1a indicate a "chemical" offset of $\simeq 0.23$ Å, typical for Ba^{+2}/Y^{+3} polarization. The spacing between the Cu2 and O2,3 layers depends clearly on doping. While the Cu2 layer starts to move towards the Ba–O layer by about 0.05 Å between the onset of the metallic phase ($x \simeq 6.38$) and x_{opt}, the O2,3 layers seem to be almost unaffected. We show in figure 3 that the scatter in the Y–O2, O3 data points does not behave arbitrarily, and that the

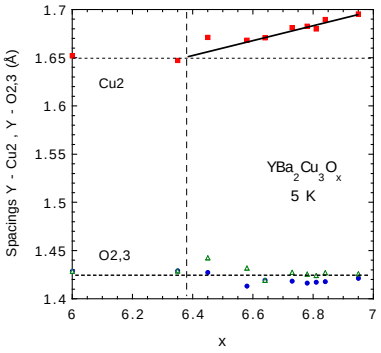
relatively weak perpendicular displacements of O2 and O3 are correlated with the planar deformations.

4.1. LATTICE PARAMETERS AND ORTHORHOMBIC DEFORMATIONS

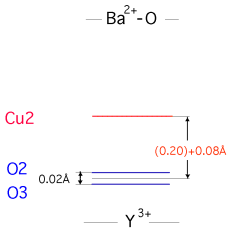
The relatively strong orthorhombicity of its unit cell puts $YBa_2Cu_3O_x$ somewhat outside the lattice systematics of the most prominent high-T_c materials, which have mostly tetragonal unit cells. Weak orthorhombic strain might be however operative also on the nominally tetragonal lattices, if a correlation-driven anisotropy of the 2-D Fermi surface is a generic feature of HTSC, as theoretically suggested by renormalization group methods (11).

Figure 2a displays the doping dependence of the lattice parameters $a, b, c/3$ in the metallic phases of $YBa_2Cu_3O_x$. $a \neq b$ in the under- and overdoped regimes, but the inequality results clearly from different types of orthorhombic strain ellipsis. The quadrupolar α-ortho stresses a while straining b, and the monopolar β-ortho stresses both axis. "Plateaus" of a and b between $x \simeq 6.8$ and 6.9 connect the two regimes suggesting a thermodynamical instable regime. If the orthorhombic strain originated exclusively from Cu1–O4 hybridization in the 1-dimensional charge reservoir, we expect the b-, and the a-axis to exhibit similar orthorhombic deformations in both, the under- and overdoped regimes. The abrupt change from the quadrupolar β-ortho to the monopolar β-ortho deformation at x_{opt} points however to an additional and different mechanism to be operative.

Figure 2b displays the doping dependence of the basal area, $B(x) = a \cdot b$. Evidently accomodation of oxygen atoms in the reservoir layer does not increase $B(x)$ as might be expected from simple stereochemical grounds,



a. Y–Cu2, Y–O2,3 spacings



b. CuO_2 intralayer spacings

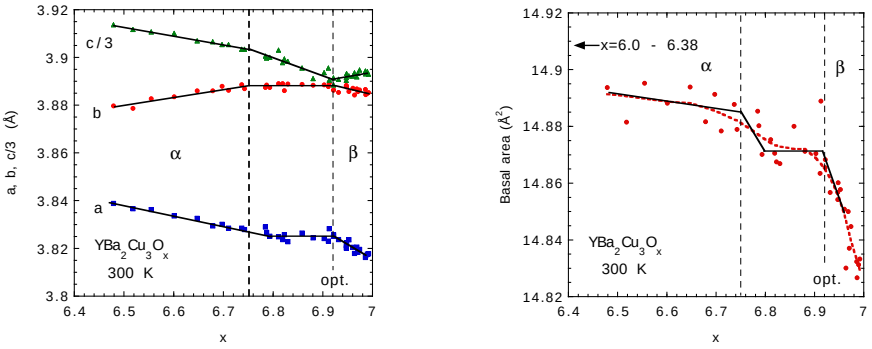
Figure 1. Layer spacings in $YBa_2Cu_3O_x$. a.: Y–Cu2, and Y–O2,3 interlayer spacings as a function of oxygen concentration, x, at 5 K. After Cava *et al.* (3). Open triangles: O2. Open circles: O3 . b.: CuO_2 plane sketched as a stack of copper and oxygen layers sandwiched between polarizing adjacent layers (arbitrary scale).

but reduces the basal area. Hence the doping dependence of $B(x)$ is most likely controlled by the ground state of the quantum liquids in the metallic planes, and not by the anisotropic oxygen diffusion processes in the non-stoichiometric chain layer. To discuss $B(x)$ in more detail we find it useful to associate $\kappa_p \propto -\partial B/\partial n_h$ with a 2-dimensional "electronic compressibility", eliminating the almost doping independent bandstructure effects. Here $n_h \propto x$ denotes the hole concentration.

$\kappa_p \simeq 0$ in the insulating phase. The plane of the spin lattice in the lightly doped Mott insulator seems to be incompressible as indicated by the arrow for $x = 6.0 - 6.38$. The magnetic exchange energy J of order 1500 K determines the electron-electron interactions in the Cu2 planes.

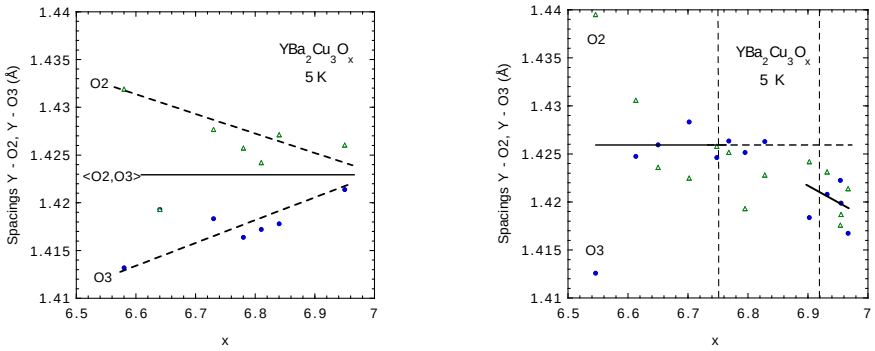
$\kappa_p > 0$ in the metallic phases. While weakly decreasing in the underdoped α-ortho regime, $B(x)$ starts to collapse in the overdoped β-ortho regime. The plateau between $x = 6.8$ and 6.9 points to phase segregation, possibly into incommensurate stripe phases. In the metallic phase the doped holes hop with a nn matrix element $t \propto d^{-n}$, $n \geq 2$, and thus shorter nn distances, d, increase strongly the kinetic energy of the holes. But the physics of the doped Mott insulator is that of competition between the exchange energy J and the kinetic energy per hole $n_h t$. The doped holes in the underdoped regime appear only as vacancies in the background of a spin singlet liquid. The lattice of such a strongly correlated $t - J$ type electron system is expected to be much harder than that of a nearly noninteracting electron liquid.

Hence the α- and β-ortho deformations may be identified as characteristic lattice responses to fundamentally different types of electron liquids in



a. Lattice parameters b. Basal area

Figure 2. a.: Lattice parameters *vs.* oxygen concentration in near-equilibrium samples of metallic $YBa_2Cu_3O_x$ synthezised by direct oxydation of the elements (DO), after Conder *et al.* (5). Drawn out lines are guides to the eye. α and β label different orthorhombic strain ellipsis, see text. b.: Basal area, $a \cdot b$, from the data in a. Dashed line: smoothed average. The step indicates the onset of a possible two-phase regime.



a. Without c-axis minimum (3) b. With c-axis minimum (13, 14)

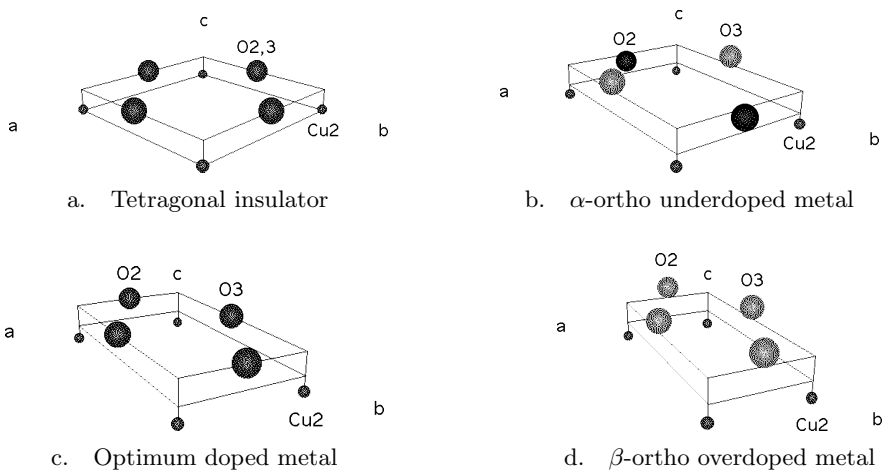
Figure 3. Spacings Y–O2, Y–O3 *vs.* oxygen content in $YBa_2Cu_3O_x$ at 5 K from neutron diffraction in different samples. Triangles: O2 (a-axis). Dots: O3 (b-axis). All lines are guides to the eye. a.: In quenched samples from the carbonate route after Cava *et al.* (3). b.: In near equilibrium samples from the BaO route after Kaldis (13), Hewat *et al.* (14).

the metallic phase: a weakly compressible $t-J$ like in the under- and optimum doped, and a strongly compressible Fermi liquid-like in the overdoped regimes.

4.2. PERPENDICULAR O2,O3 DISPLACEMENTS

Figure 3 displays the doping dependence of the interlayer spacings Y–O2, Y–O3 from samples without (3) and with (14) a c-axis minimum. At the onset of the metallic phase the degenerate tetragonal positions of the planar oxygens are split into O2 along a, and O3 along b. Both are also displaced along c: O2 by ~ -0.05 Å below, and O3 by $\sim +0.05$ Å above the tetragonal reference value, *cf.* figure 4b. The anisotropic displacement of the planar oxygens along c is usually attributed to the anisotropic Coulomb repulsion between the 1-dimensional charge reservoir and the 2-dimensional planes.

This is yet another example for Coulomb repulsion and hybridization are not able to correctly describe the doping-induced displacements in the CuO_2 layer: increasingly perfected chains in the reservoir layer relax the c-axis anisotropy of the planar O2, O3 instead of increasing them. Thus the average spacing Y–<O2,O3> matches the degenerate tetragonal reference value throughout the underdoped α-ortho regime (thick drawn out line in figures 3a,b). Meaningful crystallographic studies of the overdoped β-ortho regime require samples with a c-axis minimum around x_{opt} (13). Figure 3b displays the O2, O3 c-axis displacements in such samples (13, 14). Herein the transition into the overdoped regime seems to be connected with



a. Tetragonal insulator

b. α-ortho underdoped metal

c. Optimum doped metal

d. β-ortho overdoped metal

Figure 4. Sketches of the CuO_2 lattices in $YBa_2Cu_3O_x$. The frame indicates the dimpling due to the surrounding chemistry and bandstructure effects.

weak *unidirectional* displacements of both oxygens O2, O3 towards the Y-layer, *cf.* figure 4d. Studies of the local atomic structure by Y-EXAFS (9, 13) confirm this unidirectional c-axis shift of the planar oxygens in the overdoped regime also in standard samples without c-axis minimum (5).

We summarize the doping-induced displacements of Cu2 and O2,O3 in the schematic figures 4a-d:

i. Metallic hole concentrations increase the two-dimensional density of Cu2 by dimpling the planes. There is some similarity with the mechanism collapsing an umbrella (15). As Cu2 moves out of the plane the basal area shrinks.

ii. The underdoped regime is governed by the quadrupolar α-ortho strain. O2 and O3 shift oppositely along c such that the basal Cu2 area may adjust to a relative maximum.

iii. Close to optimum doping the quadrupolar α-ortho strain vanishes. O2 and O3 may achieve nearly degenerate c-axis positions.

iv. In the overdoped regime the deformations have changed from the quadrupolar α- to the monopolar β-ortho type stressing the a-, b-axes in the same direction therewith collapsing the basal Cu2 area. Both oxygens O2,3 shift perpendicularily in the *same* direction along c.

5. Concluding Remarks

We have undertaken an attempt to identify among the many doping-driven lattice effects in $YBa_2Cu_3O_x$ those which are most likely connected with the generic low energy electronic structure. Fermi surface driven lattice effects

are well known from the classical metals. For instance about 3/4 of the metallic elements tend to maximize the gain of kinetic energy by crystallization in most closely packed structures hcp, fcc, bcc. In electron compounds and Hume-Rothery alloys the Fermi energy is well known to avoid maxima in the density of states and to drive structural transformations changing appropriately the symmetry of the Brillouin zone. These mechanisms are expected to be operative also in low dimensional and strongly correlated electron systems. The competition between exchange and kinetic energies in strongly correlated electron systems however gives rise to new and more intricate lattice effects which, once disentagled from bandstructure effects, may yield new insights into the many electron ground state.

Acknowledgements

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klu9.clo

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1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options.

Table of Contents

1. Implementation

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1.1. Section size commands

added command: `\little`. This is identical to `\tiny` here. Allowed type provided values: 5/6, 6/7, 7/8, 8/9.5, 9/11, 10/12, 11/13, 12/14, 14/18, 17/22, 20/25.

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1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

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\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

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```

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      Let's hope that fixes it.
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  \fi
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     }%
  \fi
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  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

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1.4. Lists

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Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

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  \setlength{\leftmargin}{\leftmarginiv}%
  \setlength{\labelwidth}{\leftmarginiv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
```

```
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{18\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{18\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klut9.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options. This is a 'tight' file.

Table of Contents

1. Implementation

```
\ProvidesFile{klut9.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This is identical to `\tiny` here. Allowed type provided values: 5/6, 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 11/13, 12/14, 14/18, 17/22, 20/25.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize\@ixpt{10.5}%
   \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
   \belowdisplayskip \abovedisplayskip
   \let\listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@viiipt{9}%
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@viipt{8}%
   \abovedisplayskip 4\p@ \@plus2\p@ \@minus2\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 2\p@ \@plus\p@ \@minus1\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 2\p@ \@plus\p@ \@minus\p@
               \parsep 1\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@vipt\@viipt}
\newcommand\little{\@setfontsize\little\@vpt\@vipt}
\newcommand\tiny{\@setfontsize\tiny\@vpt\@vipt}
\newcommand\large{\@setfontsize\large\@xpt{11.5}}
\newcommand\Large{\@setfontsize\Large\@xiipt{14}}
\newcommand\LARGE{\@setfontsize\LARGE\@xivpt{18}}
\newcommand\huge{\@setfontsize\huge\@xviipt{22}}
\newcommand\Huge{\@setfontsize\Huge\@xxpt{25}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{-1in}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {12\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {25\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{10pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
```

```
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
      This is not enough,
      so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
      Let's hope that fixes it.
     }%
     \marginparwidth \z@
     \marginparsep \z@
  \fi
  \ifdim \@tempdima <2pc
     \@tempdimb=\paperwidth
     \advance\@tempdimb by -4pc
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textwidth\space (\the\textwidth)
     wider than the available total\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \oddsidemargin \@tempdima
  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
  \setlength\@tempdima{\paperheight}
  \addtolength\@tempdima{-\footskip}
  \addtolength\@tempdima{-\headheight}
  \addtolength\@tempdima{-\headsep}
  \setlength\@tempdimb{\@tempdima}
  \addtolength\@tempdima{-\textheight}
  \divide\@tempdima by 2
  \ifdim \@tempdima <2pc
  \advance\@tempdimb by -4pc
  \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textheight\space (\the\textheight)
     more than the available total.\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \setlength\topmargin{\@tempdima}
  \setlength\id@boxheight{\@tempdima}
  \advance\id@boxheight by -2pc
}

\setlength\footnotesep{6\p@}
\setlength{\skip\footins}{9\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{1.9em}
\setlength{\leftmarginii}{2em}
\setlength{\leftmarginiii}{1.7em}
\setlength{\leftmarginiv}{1.4em}
\setlength{\leftmarginv}{1em}
\setlength{\leftmarginvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep 8\p@ \@plus2\p@ \@minus2\p@
  \partopsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep 4\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 4\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmarginiii
  \labelwidth \leftmarginiii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmarginiv}%
  \setlength{\labelwidth}{\leftmarginiv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
```

```
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{18\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{10\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{18\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klu10.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options.

Table of Contents

1. Implementation

```
\ProvidesFile{klu10.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 5/6, 6/7, 7/8, 8/9.5, 9/11, 10/12, 12/14, 14/18, 17/22, 20/25, 25/30.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize\@xpt\@xiipt
   \abovedisplayskip 10\p@ \@plus 2\p@ \@minus5\p@
   \abovedisplayshortskip \z@ \@plus 3\p@
   \belowdisplayshortskip 6\p@ \@plus 3\p@ \@minus3\p@
   \belowdisplayskip \abovedisplayskip
   \let\@listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@ixpt{11}%
   \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@viiipt{9.5}%
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@viipt\@viiipt}
\newcommand\little{\@setfontsize\little\@vipt\@viipt}
\newcommand\tiny{\@setfontsize\tiny\@vpt\@vipt}
\newcommand\large{\@setfontsize\large\@xiipt{14}}
\newcommand\Large{\@setfontsize\Large\@xivpt{18}}
\newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
\newcommand\huge{\@setfontsize\huge\@xxpt{25}}
```

```
\newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{0pt}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {12\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {27.5\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{10pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
```

```
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
      This is not enough,
      so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
      Let's hope that fixes it.
     }%
     \marginparwidth \z@
     \marginparsep \z@
  \fi
  \ifdim \@tempdima <2pc
     \@tempdimb=\paperwidth
    \advance\@tempdimb by -4pc
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textwidth\space (\the\textwidth)
     wider than the available total\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \oddsidemargin \@tempdima
  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
  \setlength\@tempdima{\paperheight}
  \addtolength\@tempdima{-\footskip}
  \addtolength\@tempdima{-\headheight}
  \addtolength\@tempdima{-\headsep}
  \setlength\@tempdimb{\@tempdima}
  \addtolength\@tempdima{-\textheight}
  \divide\@tempdima by 2
  \ifdim \@tempdima <2pc
  \advance\@tempdimb by -4pc
  \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textheight\space (\the\textheight)
     more than the available total.\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \setlength\topmargin{0pt}
  \setlength\id@boxheight{\@tempdima}
  \advance\id@boxheight by -2pc
}
```

```
\setlength\footnotesep{6.65\p@}
\setlength{\skip\footins}{9\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{2em}
\setlength{\leftmarginii}{2.2em}
\setlength{\leftmariniii}{1.87em}
\setlength{\leftmariniv}{1.7em}
\setlength{\leftmarinv}{1em}
\setlength{\leftmarinvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep  9\p@ \@plus 3\p@ \@minus 5\p@
  \partopsep 3\p@ \@plus 1\p@ \@minus 2\p@
  \itemsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 4.5\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmariniii
  \labelwidth \leftmariniii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmariniv}%
  \setlength{\labelwidth}{\leftmariniv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
```

```
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klut10.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options. This is a the 'tight' file.

Table of Contents

1. Implementation

```
\ProvidesFile{klut10.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 5/6, 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 12/14, 14/18, 17/22, 20/25, 25/30.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize\@xpt{11.5}%
   \abovedisplayskip 10\p@ \@plus 2\p@ \@minus5\p@
   \abovedisplayshortskip \z@ \@plus 3\p@
   \belowdisplayshortskip 6\p@ \@plus 3\p@ \@minus3\p@
   \belowdisplayskip \abovedisplayskip
   \let\@listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@ixpt{10.5}%
   \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@viiipt{9}%
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@viipt\@viiipt}
\newcommand\little{\@setfontsize\little\@vipt\@viipt}
\newcommand\tiny{\@setfontsize\tiny\@vpt\@vipt}
\newcommand\large{\@setfontsize\large\@xiipt{14}}
\newcommand\Large{\@setfontsize\Large\@xivpt{18}}
\newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
\newcommand\huge{\@setfontsize\huge\@xxpt{25}}
```

```
\newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{-1in}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {12\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {27.5\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{10pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
```

```
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
      This is not enough,
      so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
      Let's hope that fixes it.
     }%
     \marginparwidth \z@
     \marginparsep \z@
  \fi
  \ifdim \@tempdima <2pc
     \@tempdimb=\paperwidth
     \advance\@tempdimb by -4pc
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textwidth\space (\the\textwidth)
     wider than the available total\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \oddsidemargin \@tempdima
  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
  \setlength\@tempdima{\paperheight}
  \addtolength\@tempdima{-\footskip}
  \addtolength\@tempdima{-\headheight}
  \addtolength\@tempdima{-\headsep}
  \setlength\@tempdimb{\@tempdima}
  \addtolength\@tempdima{-\textheight}
  \divide\@tempdima by 2
  \ifdim \@tempdima <2pc
  \advance\@tempdimb by -4pc
  \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textheight\space (\the\textheight)
     more than the available total.\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \setlength\topmargin{\@tempdima}
  \setlength\id@boxheight{\@tempdima}
  \advance\id@boxheight by -2pc
}
```

```
\setlength\footnotesep{6.65\p@}
\setlength{\skip\footins}{9\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{2em}
\setlength{\leftmarginii}{2.2em}
\setlength{\leftmarginiii}{1.87em}
\setlength{\leftmarginiv}{1.7em}
\setlength{\leftmarginv}{1em}
\setlength{\leftmarginvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep  9\p@ \@plus 3\p@ \@minus 5\p@
  \partopsep 3\p@ \@plus 1\p@ \@minus 2\p@
  \itemsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 4.5\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmarginiii
  \labelwidth \leftmarginiii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmarginiv}%
  \setlength{\labelwidth}{\leftmarginiv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
```

```
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klut11.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options. This is a the 'tight' file.

Table of Contents

1. Implementation

```
\ProvidesFile{klut11.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 11/12.5, 12/14, 14/18, 17/22, 20/25, 25/30.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize\@xipt{12.5}%
   \abovedisplayskip 10\p@ \@plus 2\p@ \@minus5\p@
   \abovedisplayshortskip \z@ \@plus 3\p@
   \belowdisplayshortskip 6\p@ \@plus 3\p@ \@minus3\p@
   \belowdisplayskip \abovedisplayskip
   \let\@listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@xpt{11.5}%
   \abovedisplayskip 9\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 5\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@ixpt{10.5}%
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt{9.5}}
\newcommand\little{\@setfontsize\little\@viipt\@viiipt}
\newcommand\tiny{\@setfontsize\tiny\@vipt\@viipt}
\newcommand\large{\@setfontsize\large\@xiipt{14}}
\newcommand\Large{\@setfontsize\Large\@xivpt{18}}
\newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
\newcommand\huge{\@setfontsize\huge\@xxpt{25}}
```

```
\newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{-1in}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {12\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {27.5\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{10pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
```

```
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
      This is not enough,
      so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
      Let's hope that fixes it.
     }%
     \marginparwidth \z@
     \marginparsep \z@
  \fi
  \ifdim \@tempdima <2pc
     \@tempdimb=\paperwidth
     \advance\@tempdimb by -4pc
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textwidth\space (\the\textwidth)
     wider than the available total\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \oddsidemargin \@tempdima
  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
  \setlength\@tempdima{\paperheight}
  \addtolength\@tempdima{-\footskip}
  \addtolength\@tempdima{-\headheight}
  \addtolength\@tempdima{-\headsep}
  \setlength\@tempdimb{\@tempdima}
  \addtolength\@tempdima{-\textheight}
  \divide\@tempdima by 2
  \ifdim \@tempdima <2pc
  \advance\@tempdimb by -4pc
  \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textheight\space (\the\textheight)
     more than the available total.\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \setlength\topmargin{\@tempdima}
  \setlength\id@boxheight{\@tempdima}
  \advance\id@boxheight by -2pc
}
```

```
\setlength\footnotesep{6.65\p@}
\setlength{\skip\footins}{9\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{2em}
\setlength{\leftmarginii}{2.2em}
\setlength{\leftmariniii}{1.87em}
\setlength{\leftmariniv}{1.7em}
\setlength{\leftmarinv}{1em}
\setlength{\leftmarinvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep  9\p@ \@plus 3\p@ \@minus 5\p@
  \partopsep 3\p@ \@plus 1\p@ \@minus 2\p@
  \itemsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 4.5\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmariniii
  \labelwidth \leftmariniii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmariniv}%
  \setlength{\labelwidth}{\leftmariniv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
```

```
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klut12.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options. This is a tight version.

Table of Contents

1. Implementation

```
\ProvidesFile{klut12.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 8/9, 9/10.5, 10/11.5, 11/12.5 12/13.5, 14/18, 17/22, 20/25, 25/30.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize\@xiipt{13.5}%
   \abovedisplayskip 11\p@ \@plus 2\p@ \@minus5\p@
   \abovedisplayshortskip 1\p@ \@plus 3\p@
   \belowdisplayshortskip 7\p@ \@plus 3\p@ \@minus3\p@
   \belowdisplayskip \abovedisplayskip
   \let\@listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@xipt{12.5}%
   \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@xpt{11.5}%
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@ixpt{10.5}}
\newcommand\little{\@setfontsize\little\@viiipt{9}}
\newcommand\tiny{\@setfontsize\tiny\@vipt\@viipt}
\newcommand\large{\@setfontsize\large\@xivpt{18}}
\newcommand\Large{\@setfontsize\Large\@xviipt{22}}
\newcommand\LARGE{\@setfontsize\LARGE\@xxpt{25}}
\newcommand\huge{\@setfontsize\huge\@xxvpt{30}}
\newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{-1in}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {12\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {27.5\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{12pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
```

```
     This is not enough,
     so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
     Let's hope that fixes it.
    }%
    \marginparwidth \z@
    \marginparsep \z@
 \fi
 \ifdim \@tempdima <2pc
    \@tempdimb=\paperwidth
    \advance\@tempdimb by -4pc
    \@settopoint\@tempdimb
    \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
    made your \string\textwidth\space (\the\textwidth)
    wider than the available total\MessageBreak
    (Which is: \the\@tempdimb). Please press X and try again.
    }%
 \fi
 \oddsidemargin \@tempdima
 \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
 \setlength\@tempdima{\paperheight}
 \addtolength\@tempdima{-\footskip}
 \addtolength\@tempdima{-\headheight}
 \addtolength\@tempdima{-\headsep}
 \setlength\@tempdimb{\@tempdima}
 \addtolength\@tempdima{-\textheight}
 \divide\@tempdima by 2
 \ifdim \@tempdima <2pc
 \advance\@tempdimb by -4pc
 \@settopoint\@tempdimb
    \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
    made your \string\textheight\space (\the\textheight)
    more than the available total.\MessageBreak
    (Which is: \the\@tempdimb). Please press X and try again.
    }%
 \fi
 \setlength\topmargin{\@tempdima}
 \setlength\id@boxheight{\@tempdima}
 \advance\id@boxheight by -2pc
}


\setlength\footnotesep{6.65\p@}
\setlength{\skip\footins}{12\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{2em}
\setlength{\leftmarginii}{2.2em}
\setlength{\leftmarginiii}{1.87em}
\setlength{\leftmarginiv}{1.7em}
\setlength{\leftmarginv}{1em}
\setlength{\leftmarginvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep  11\p@ \@plus 3\p@ \@minus 5\p@
  \partopsep 4.5\p@ \@plus 1\p@ \@minus 2\p@
  \itemsep 6\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 6\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 6\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 3\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmarginiii
  \labelwidth \leftmarginiii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmarginiv}%
  \setlength{\labelwidth}{\leftmarginiv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
```

```
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{24\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{24\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{10\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{10\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```

klu105.clo

Kluwer Academic Publishers

1998/02/11

Abstract. This internal file takes care of list definitions and 'general' point size options.

Table of Contents

1. Implementation

```
\ProvidesFile{klu105.clo}[\filedate ]
```

1.1. Section size commands

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 7/8, 9/11, 10/11.5, 10.5/12, 11/13, 12/14, 14/18, 17/22, 20/25, 25/30.

```
\renewcommand\normalsize{%
   \@setfontsize\normalsize{10.5pt}{12}%
   \abovedisplayskip 10\p@ \@plus 2\p@ \@minus5\p@
   \abovedisplayshortskip \z@ \@plus 3\p@
   \belowdisplayshortskip 6\p@ \@plus 3\p@ \@minus3\p@
   \belowdisplayskip \abovedisplayskip
   \let\@listi\@listI}
\normalsize
\newcommand\small{%
   \@setfontsize\small\@xpt{11.5}%
   \abovedisplayskip 9\p@ \@plus3\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus2\p@
   \belowdisplayshortskip 5\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\footnotesize{%
   \@setfontsize\footnotesize\@ixpt\@xipt
   \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 3\p@ \@plus\p@ \@minus\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep}%
   \belowdisplayskip \abovedisplayskip
}
\newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt{9.5}}
\newcommand\little{\@setfontsize\little\@viipt\@viiipt}
\newcommand\tiny{\@setfontsize\tiny\@vipt\@viipt}
\newcommand\large{\@setfontsize\large\@xiipt{14}}
\newcommand\Large{\@setfontsize\Large\@xivpt{18}}
\newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
\newcommand\huge{\@setfontsize\huge\@xxpt{25}}
```

```
\newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

1.2. Various values

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
\setlength\hoffset{-1in}
\setlength\voffset{-1in}
\setlength\parindent {14\p@}
\setlength\headheight{12\p@}
\setlength\headsep   {13\p@}
\setlength\topskip   {10\p@}
\setlength\footskip  {27.5\p@}
\setlength\marginparsep{10pt}
\setlength\marginparpush{5\p@}
\setlength\maxdepth  {.5\topskip}
\setlength\@maxdepth\maxdepth
\setlength\columnsep{10pt}
\setlength\columnseprule{0pt}
\setlength\fboxsep{3pt}
\setlength\fboxrule{.4pt}
```

1.3. Textheight and textwidth

These are the main reason for the existence of these files. For some stupid reason, LaTeX calculates textwidth out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the 'dead' corners in most laserprinters.

Calculations are done 'AtBeginDocument' to allow changes made in the preamble and later on in the stylefile.

```
\newdimen\id@boxheight
\AtBeginDocument{%
  \setlength\@tempdima{\paperwidth}%
  \addtolength\@tempdima{-\textwidth}%
  \divide\@tempdima by 2
  \setlength\@tempdimb\marginparwidth
  \addtolength\@tempdimb\marginparsep
  \addtolength\@tempdimb{2pc}%
  \ifdim \@tempdima <\@tempdimb
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
```

```
      your \string\textwidth\space (\the\textwidth) and
      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
      The allowed value for margin space: (\the\@tempdima). Needed value:
      (\the\@tempdimb).\MessageBreak
      This is not enough,
      so I will set \string\marginparwidth\space  to 0pt.\MessageBreak
      Let's hope that fixes it.
     }%
     \marginparwidth \z@
     \marginparsep \z@
  \fi
  \ifdim \@tempdima <2pc
     \@tempdimb=\paperwidth
     \advance\@tempdimb by -4pc
     \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textwidth\space (\the\textwidth)
     wider than the available total\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \oddsidemargin \@tempdima
  \evensidemargin \@tempdima
```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```
  \setlength\@tempdima{\paperheight}
  \addtolength\@tempdima{-\footskip}
  \addtolength\@tempdima{-\headheight}
  \addtolength\@tempdima{-\headsep}
  \setlength\@tempdimb{\@tempdima}
  \addtolength\@tempdima{-\textheight}
  \divide\@tempdima by 2
  \ifdim \@tempdima <2pc
  \advance\@tempdimb by -4pc
  \@settopoint\@tempdimb
     \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
     made your \string\textheight\space (\the\textheight)
     more than the available total.\MessageBreak
     (Which is: \the\@tempdimb). Please press X and try again.
     }%
  \fi
  \setlength\topmargin{\@tempdima}
  \setlength\id@boxheight{\@tempdima}
  \advance\id@boxheight by -2pc
}
```

```
\setlength\footnotesep{6.65\p@}
\setlength{\skip\footins}{9\p@ \@plus 4\p@ \@minus 2\p@}
```

1.4. Lists

List default values

```
\setlength\partopsep{2\p@ \@plus 1\p@ \@minus 1\p@}
\setlength{\leftmargini}{2em}
\setlength{\leftmarginii}{2.2em}
\setlength{\leftmarginiii}{1.87em}
\setlength{\leftmarginiv}{1.7em}
\setlength{\leftmarginv}{1em}
\setlength{\leftmarginvi}{1em}
\setlength{\labelsep}{.4em}
\setlength{\labelwidth}{\leftmargini}
\addtolength{\labelwidth}{-\labelsep}
```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```
\def\@listI{%
  \leftmargin \leftmargini
  \topsep  9\p@ \@plus 3\p@ \@minus 5\p@
  \partopsep 3\p@ \@plus 1\p@ \@minus 2\p@
  \itemsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 4.5\p@ \@plus 2\p@ \@minus 1\p@ }
\def\@listii{%
  \leftmargin \leftmarginii
  \labelwidth \leftmarginii
  \advance\labelwidth by -\labelsep
  \topsep 4.5\p@ \@plus 2\p@ \@minus 1\p@
  \parsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \itemsep \parsep}
\def\@listiii{%
  \leftmargin \leftmarginiii
  \labelwidth \leftmarginiii
  \advance\labelwidth by -\labelsep
  \topsep 2\p@ \@plus 1\p@ \@minus 1\p@
  \parsep \z@
  \partopsep 1\p@ \@plus 0\p@ \@minus 1\p@
  \itemsep \topsep}
\def\@listiv{%
  \setlength{\leftmargin}{\leftmarginiv}%
  \setlength{\labelwidth}{\leftmarginiv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listv{%
```

```
  \setlength{\leftmargin}{\leftmarginv}%
  \setlength{\labelwidth}{\leftmarginv}%
  \addtolength{\labelwidth}{-\labelsep}}
\def\@listvi{%
  \setlength{\leftmargin}{\leftmarginvi}%
  \setlength{\labelwidth}{\leftmarginvi}%
  \addtolength{\labelwidth}{-\labelsep}}
\let\@listi\@listI
\@listi
```

1.5. Float separation parameters

Separation on text pages.

```
\setlength\floatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\textfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
\setlength\intextsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dblfloatsep{12\p@ \@plus 2\p@ \@minus 2\p@}
\setlength\dbltextfloatsep{20\p@ \@plus 2\p@ \@minus 4\p@}
```

Separation on float pages

```
\setlength\@fptop{0\p@ \@plus 1fil}
\setlength\@fpsep{8\p@ \@plus 2fil}
\setlength\@fpbot{0\p@ \@plus 1fil}
\setlength\@dblfptop{0\p@ \@plus 1fil}
\setlength\@dblfpsep{8\p@ \@plus 2fil}
\setlength\@dblfpbot{0\p@ \@plus 1fil}

\endinput
```